

ABSTRACT

The present invention relates to an apparatus and method for forming a high-temperature superconducting film on a long tape substrate at speeds suitable for large-scale production. The method includes a spooling system for use in a high-throughput, continuous pulsed laser deposition (PLD) process in which a superconducting layer, such as yttrium-barium-copper-oxide (YBCO), is deposited atop a buffered metal substrate tape that is translated through one or more deposition chambers via the action of a reel-to-reel spooling system and a conductive-radiant multi-zone substrate heater. It also optionally includes a multi-target manipulator apparatus and multiple laser beams in which multiple targets are impinged upon simultaneously.